US005270744A

United States Patent [19]

Portney

[11] Patent Number: 5,270,744

[45] Date of Patent: * Dec. 14, 1993

[54] MULTIFOCAL OPHTHALMIC LENS

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[*] Notice: The portion of the term of this patent subsequent to Feb. 6, 2007 has been disclaimed.

[21] Appl. No.: 935,586

[22] Filed: Aug. 26, 1992

Related U.S. Application Data

[60] Division of Ser. No. 465,477, Jan. 16, 1990, Pat. No. 5,166,712, which is a division of Ser. No. 366,319, Jun. 14, 1989, Pat. No. 4,898,461, which is a continuation of Ser. No. 56,050, Jun. 1, 1987, abandoned.

[51] Int. Cl.[5] G02C 7/04; A61F 2/16

[52] U.S. Cl. 351/161; 351/169; 623/6

[58] Field of Search ..... 351/160 R, 160 H, 161, 351/162, 169; 623/6

[56] **References Cited**

U.S. PATENT DOCUMENTS

Re. 25,286	11/1962	DeCarle	351/161
1,483,509	2/1924	Bugbee	65/39
2,129,305	9/1938	Feinbloom	351/160 R
2,274,142	2/1942	Houchin	351/168
2,405,989	8/1946	Beach	351/169
2,511,517	6/1950	Spiegel	69/77
3,004,470	10/1961	Ruhle	351/168
3,031,927	5/1962	Wesley	351/161
3,034,403	5/1962	Neefe	351/162
3,210,894	10/1965	Bentley	51/284 R

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

0064812	11/1982	European Pat. Off. .	
0140063	9/1984	European Pat. Off.	351/161
0169599	1/1986	European Pat. Off. .	
2702117	7/1978	Fed. Rep. of Germany .	
3246306	6/1984	Fed. Rep. of Germany .	
253097A5	1/1988	German Democratic Rep. .	
58-143316	8/1983	Japan .	
WO86/03961	7/1986	PCT Int'l Appl.	351/161
WO87/00299	1/1987	PCT Int'l Appl.	351/161
WO87/07496	12/1987	PCT Int'l Appl. .	
939016	10/1963	United Kingdom	351/161
2058391A	4/1981	United Kingdom .	
2129155A	5/1984	United Kingdom .	
2146791A	4/1985	United Kingdom .	

OTHER PUBLICATIONS

DeCarle; "Further Developments of Bifocal Contact Lenses"; *Contacto*; Jun. 1960; pp. 185–186.

Encyclopedia of Contact Lens Practice; Chapt. XXIII; Sep. 1960; pp. 24–26.

Mandell; *Contact Lens Practice*; pp. 211–212, 403–404, 491–492, 792.

"The Shah Bifocal Intraocular Lens Implant", Shah & Shah Intraocular Lens Laboratories, Calcutta, India.

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[57] **ABSTRACT**

An improved opthalmic lens is disclosed which has a plurality of alternating power zones with a continuously varying power within each zone, as well as in transition from one zone to another. In other words, a plurality of concentric zones (at least two) are provided in which the variation from far to near vision correction is continuous, i.e., from near correction focal power to far correction focal power, then back to near, and again back to far, or vice versa. This change is continuous (progressive), without any abrupt correction changes, or "edges".

Two versions of the invention are disclosed. In the first version continuous, alternating power variation is accomplished by a continuously changing curvature of the lens posterior surface, thereby altering the angle of impact of light rays on the eye.

In the second version continuous, alternating power variation is accomplished by creating non-homogeneous surface characteristics having refractive material indexes which continuously vary in the lens radial direction out from the optical axis).

15 Claims, 7 Drawing Sheets